

IN THE CLAIMS

Please amend the claims as follows:

1. - 7. (Canceled)

8. (Currently Amended) A method for dicing workpieces, comprising:

scribing a workpiece with a laser to form a scribe having a depth of at least 25 microns;
directing a coolant onto the scribe to reduce a thermal effect on the workpiece;

and

completely cutting through the workpiece along the scribe with a mechanical cutter that follows the scribe created by the laser.

9. (Original) The method of claim 8, wherein scribing includes setting the laser to have an average power of about 300 watts and a maximum refresh rate of 3,000 Hz.

10. (Original) The method of claim 8, wherein completely cutting includes engaging the wafer at the scribe with a saw.

11. (Previously Presented) The method of claim 10, wherein engaging the wafer includes sawing the wafer with a nickel-diamond cutting surface.

12. (Original) The method of claim 8, wherein scribing includes scribing the wafer with a yttrium-aluminum-garnet (YAG) laser.

13. (Currently Amended) A method for dicing workpieces, comprising:

scribing a workpiece with a laser along a saw street to form a scribe having a depth of at least 25 microns;

providing a coolant to a surface of the workpiece proximate to the scribe to reduce a thermal effect on the workpiece;

and

completely cutting through the workpiece with a mechanical cutter in the same saw street being scribed by the laser, wherein the laser and the mechanical cutter simultaneously contact the workpiece.

14. (Original) The method of claim 13, wherein completely cutting includes fixing the mechanical cutter at a set distance behind the laser.

15. (Original) The method of claim 14, wherein scribing includes setting the laser to have an average power of about 300 watts and a maximum refresh rate of 3,000 Hz.

16. (Currently Amended) A method for dicing workpieces, comprising:

moving a workpiece relative to a laser;

scribing a workpiece with the laser to form a scribe having a depth of at least 25 microns;

locally cooling a surface of the workpiece by providing a coolant proximate to the scribe
to reduce a temperature effect on the workpiece;

and

completely cutting through the workpiece along the scribe with a mechanical cutter that follows a scribe created by the laser.

17. (Original) The method of claim 16, wherein moving includes moving the workpiece at a speed of 120 mm/sec.

18. (Original) The method of claim 17, wherein scribing includes setting the laser to have an average power of about 300 watts and a maximum refresh rate of 3,000 Hz.

19. (Original) The method of claim 16, wherein moving a workpiece relative to a laser includes holding the laser stationary.

20. (Original) The method of claim 16, wherein completely cutting through the workpiece includes cutting the workpiece with a nickel coated blade.

21. (Previously Presented) The method of claim 16, wherein cutting includes the mechanical cutter directly following the laser in the scribe at a fixed distance.

22. (Previously Presented) The method of claim 13, wherein cutting includes the laser and mechanical cutter simultaneously engaging a same saw street.

23. (Previously Presented) The method of claim 9, wherein cutting includes the mechanical cutter directly following the laser in the scribe at a fixed distance.

24. (Currently Amended) A method for dicing an integrated circuit substrate, comprising:

moving a substrate relative to a laser;

partially ablating a saw street in the substrate with a laser to form a scribe having a depth of at least 25 microns;

cooling the scribe by providing a coolant proximate to the scribe to reduce a thermal effect on the workpiece;

and

completely cutting through the saw street of the substrate along the scribe with a mechanical cutter that follows the scribe created by the laser.

25. (Previously Presented) The method of claim 24, wherein cutting includes the mechanical cutter directly following the laser at a fixed distance.

26. (Previously Presented) The method of claim 24, wherein moving includes moving the substrate at a speed of about 120 mm/sec.

27. (Previously Presented) The method of claim 24, wherein ablating includes setting the laser to have an average power of about 300 watts and a maximum refresh rate of 3,000 Hz.

28. (Withdrawn) A method of wafer dicing, comprising:
 providing a laser that is configured to scribe the wafer using a liquid-guided laser beam;
and
 cutting the wafer along the scribe with a mechanical cutter.
29. (Withdrawn) The method of claim 28, wherein providing a laser comprises setting the laser to have an average power that ranges between approximately 100 watts and approximately 300 watts, and having a refresh rate that is less than approximately 3,000 Hz.
30. (Withdrawn) The method of claim 28, wherein providing a laser comprises providing one of a yttrium-aluminum-garnet (YAG) laser, a neodymium-YAG laser and an excimer laser.
31. (Withdrawn) The method of claim 28, wherein cutting the wafer comprises moving a saw along the scribe.
32. (Withdrawn) The method of claim 31, wherein moving a saw along the scribe comprises sawing the wafer with a nickel-diamond cutting surface.
33. (Withdrawn) A method of dicing a workpiece, comprising:
 scribing the workpiece with a laser along a saw street provided in the workpiece with a liquid-guided laser beam; and
 severing the workpiece along the scribe within the saw street.
34. (Withdrawn) The method of claim 33, wherein severing the workpiece comprises:
 positioning a mechanical cutter within the saw street; and
 moving the mechanical cutter along the scribe.

35. (Withdrawn) The method of claim 33, wherein scribing the workpiece with a laser comprises adjusting the laser to have an average power that ranges between approximately 100 watts and approximately 300 watts, and having a refresh rate that is less than approximately 3,000 Hz.

36. (Withdrawn) The method of claim 28, wherein scribing the workpiece with a laser comprises scribing the workpiece using one of a yttrium-aluminum-garnet (YAG) laser, a neodymium-YAG laser and an excimer laser.

37. (Withdrawn) A method of dicing a workpiece, comprising:
moving the workpiece relative to a laser that is coupled to a liquid source;
scribing the workpiece with a liquid-guided laser beam generated by the laser to form a scribe; and
cutting through the workpiece along the scribe with a mechanical cutter that follows the scribe.

38. (Withdrawn) The method of claim 37, wherein moving the workpiece relative to a laser comprises moving the workpiece at a speed of approximately 120 mm/sec.

39. (Withdrawn) The method of claim 37, wherein moving the workpiece relative to a laser comprises maintaining one of the workpiece and the laser in a stationary position.

40. (Withdrawn) The method of claim 37, further comprising guiding the laser beam to a surface of the workpiece using a liquid stream generated by the liquid source.

41. (Withdrawn) The method of claim 40, wherein guiding the laser beam to a surface of the workpiece using a liquid stream comprises generating a liquid stream having a diameter that is approximately equal to a laser beam diameter.

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42. (Withdrawn) The method of claim 40, wherein guiding the laser beam to a surface of the workpiece using a liquid stream comprises generating a liquid stream having a diameter that ranges between approximately 50 microns and 150 microns.
43. (Withdrawn) The method of claim 37, wherein moving the workpiece relative to a laser comprises adjusting the laser to have an average power that ranges between approximately 100 watts and approximately 300 watts, and having a refresh rate that is less than approximately 3,000 Hz.
44. (Withdrawn) The method of claim 37, wherein moving the workpiece relative to a laser comprises moving one of a yttrium-aluminum-garnet (YAG) laser, a neodymium-YAG laser and an excimer laser.
45. (Withdrawn) The method of claim 37, wherein cutting through the workpiece along the scribe comprises cutting using a mechanical cutter that directly follows the laser in the scribe at a fixed distance.
46. (Withdrawn) A method of dicing a substrate, comprising:
moving the substrate relative to a laser that is fluidly coupled to a liquid supply;
ablating a saw street in the substrate with a liquid-guided laser beam to form a scribe in the saw street; and
cutting through the saw street of the substrate along the scribe with a mechanical cutter that follows the scribe in the saw street.
47. (Withdrawn) The method of claim 46, wherein cutting comprises moving a mechanical cutter directly following the laser at a fixed distance.
48. (Withdrawn) The method of claim 46, wherein moving the substrate relative to a laser comprises moving the substrate at a speed of approximately 120 mm/sec.

49. (Withdrawn) The method of claim 46, wherein ablating a saw street in the substrate comprises guiding the laser beam to a surface of the workpiece using a liquid stream generated by the liquid source.

50. (Withdrawn) The method of claim 49, wherein guiding the laser beam to a surface of the workpiece using a liquid stream comprises generating a liquid stream having a diameter that is approximately equal to a laser beam diameter.

51. (Withdrawn) The method of claim 49, wherein guiding the laser beam to a surface of the workpiece using a liquid stream comprises generating a liquid stream having a diameter that ranges between approximately 50 microns and 150 microns.

52. (Withdrawn) The method of claim 46, wherein ablating a saw street in the substrate comprises adjusting the laser to have an average power that ranges between approximately 100 watts and approximately 300 watts, and having a refresh rate that is less than approximately 3,000 Hz.

53. (Withdrawn) The method of claim 46, wherein ablating a saw street in the substrate comprises ablating the saw street using one of a yttrium-aluminum-garnet (YAG) laser, a neodymium-YAG laser and an excimer laser.